

## Simulation to improve medical student confidence and preparedness to care for a dying patient and their family: a feasibility study

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**Using simulation to improve medical student confidence and  
preparedness to care for a dying patient and their family: a  
feasibility study**

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**Abstract:**

**Background:** Undergraduate teaching currently fails to adequately prepare doctors to deliver 'end-of-life' care. Despite much evidence supporting simulation-based teaching, its use in medical undergraduate palliative and 'end-of-life' care curricula remain low.

**Aim:** This study assesses whether simulation can improve the confidence and preparedness of medical students to provide holistic care to dying patients and their families, from clinical assessment to symptom management, communication, and care after death.

**Methods:** Six 4th-year medical students undertook individual simulations involving a dying patient (Hi-fidelity simulator) and family member (actor). Intentional patient death occurred in four of the six scenarios (although unexpected by students). Pre/post-simulation Thanatophobia questionnaires measured student attitudes towards providing care to dying patients. Thematic analysis of post-simulation focus group transcripts generated qualitative data regarding student preparedness, confidence, and value of the simulations.

**Results:** Thematic analysis revealed that students felt the simulations were realistic, and left them better prepared to care for dying patients. Students coveted the 'safe' exposure to dying patient scenarios afforded by the simulations. Observed post-simulation reduction in mean Thanatophobia scores was not found to be statistically significant ( $p=0.07$ ).

**Conclusions:** Results suggest a feasible potential for simulations to influence undergraduate medical student teaching on the care of a dying patient and their family. We believe this study adds to the limited body of literature exploring the value of simulation in improving the confidence and preparedness of medical students to provide 'end-of-life' care. Further research into the cost-effectiveness of simulation is required to further support its application in this setting.

## **Introduction:**

Simulation training has been shown to improve the preparedness of medical practitioners in acute, trauma, and intensive care settings. <sup>1</sup> Literature suggests skills underpinning palliative medicine teaching (understanding, emotional preparedness, debriefing skills) can be taught using simulation. <sup>2</sup>

Despite established use of simulation within undergraduate nursing programmes, 'end-of-life' care teaching follows a more theoretical approach in medical undergraduate curricula. <sup>3</sup>

In 2017 a UK medical school survey found that 97% (n=33) of medical students felt they should be exposed to 'end-of-life' scenarios, with 88% (n=30) stating that simulated patients should be allowed to die as this would help prepare them to deal with death by being able to practice in a safe, realistic environment. <sup>4</sup>

Lack of exposure to dying patients and reduced access to 'end-of-life' care education are significant barriers to medical undergraduate teaching. <sup>5, 6</sup> Amongst all qualified doctors, Foundation Year 1 (FY1) trainees spend the most time with dying patients, often looking after an actively dying patient on their first day. <sup>5</sup> The General Medical Council recognise 'end-of-life' care as a core competency, <sup>7</sup> therefore it is important that medical schools provide the necessary practical reinforcement of theoretical skills in 'end-of-life' care to enable our graduates to meet these expectations. <sup>8</sup>

Simulation may be the answer to increasing student exposure to as-it-happens 'end-of-life' situations, allowing general theoretical concepts to be put into practice, with expert facilitators on hand to help guide students through scenarios.

The aims of this study were to:

- Explore baseline and post-simulation attitudes of medical students towards caring for a dying patient
- Ascertain whether simulated experience of caring for a dying patient and their family could positively influence medical student confidence and preparedness

- Ascertain whether simulation could be an acceptable method by which to teach this subject.

## **Methodology**

This is a feasibility study. Thematic analysis of post-simulation focus group transcriptions facilitated data collection on acceptability of the simulations to the students, whether they felt simulations were realistic, and how this may fit into the current undergraduate curriculum.

A separate Thanatophobia Scale Questionnaire <sup>9</sup> was deployed to identify any pre/post simulation changes in attitudes towards caring for a dying patient.

### **Participant selection:**

Six participants were required to allow simulations to run within the limitations of the student timetable and simulation suite availability. To be eligible, students had to be in their 4<sup>th</sup> year of study at our medical school and have completed their palliative care rotation. This was to ensure all students had received the same amount of palliative care teaching at the time of the study.

Eligible students (n=155) were randomly assigned a number using Excel, and were contacted in ascending numerical order with basic study details until six students volunteered their participatory interest. Further study information and a consent form were supplied to interested individuals. Students who declined the invitation were not expected to provide a reason for doing so.

### **Study setting:**

Simulations took place in the hi-fidelity simulation suite (with observation room) based within the university campus in July 2018. Following group introductions students received a 15-minute refresher lecture on symptom control in the dying patient (delivered by a palliative medicine consultant).

Each scenario was designed to involve a single student, simulated patient (Hi-Fidelity Sim-Man), simulated relative (actor) and a simulated nurse (professional ward nurse) in a ward side-room environment. Basic physiological Sim-Man parameters were set for each scenario, with respiratory rate, audible chest sounds and pulse rate changing between scenarios to foster realism. A mock set of patients' notes containing the last consultant ward round entry, plus a mock drug chart (with prescribed 'end-of-life' medications) were available for each scenario. In all scenarios, the simulated patient was unconscious.

#### Study scenarios:

The overarching aim of each scenario was to provide each student with exposure to an aspect of care in relation to a dying patient.

In the first four scenarios the simulated patient died (planned death) at around 6 minutes. Students were not aware this would happen. The goal of these scenarios was to enable the student to practice clinical assessment of a dying patient, manage uncertainty, and appropriately manage the situation and relatives' response once death had occurred (responses differed between scenarios, ranging from distress, anger and guilt to concerns regarding medications).

In the final two scenarios the patient remained alive. Students were expected to carry out a focused clinical assessment in relation to concerns from the relative regarding clinically assisted nutrition and hydration at the 'end-of-life', spiritual concerns, and fear of what death may look like.

#### Data collection and analysis:

A 20-minute post-simulation focus group (conducted by GW) facilitated the collection of qualitative data. Questions focused on participant's feelings following participation in the scenarios, their views on simulation reality, and whether they felt simulation could improve confidence and preparedness of future doctors to look after dying patients. Answers were recorded using a Dictaphone, before

being transcribed and anonymised (by GW). To foster credibility in data analysis, thematic analysis was conducted independently by all three authors to the point of saturation before meeting as a group to agree final themes.

Volunteer participants were sent a pre-simulation Thanatophobia scale questionnaire. This Likert-scale tool is validated to obtain quantitative data measuring medical students' attitudes towards caring for dying patients.<sup>10</sup> Participants were asked to complete a second, identical, post-simulation questionnaire. Both sets of questionnaires were anonymised. Pre and post-simulation scores were tabulated before being analysed using SPSS software.

#### **Ethical approval:**

Ethical approval was granted from the University's Research Governance and Ethics Committee (RGEC).

### **RESULTS**

Forty students (26% of the fourth-year cohort) were contacted prior to achieving the desired participant number of six (15%). Average participant age was 23.3 years, with a male/female ratio of 2:4.

#### **Quantitative Analysis**

A reduction in mean Thanatophobia score was observed following the simulations for all questions within the questionnaire, from 3.6 (pre-simulation) to 2.4 (post-simulation). A paired samples T test concluded that whilst a difference existed between pre and post simulation means, the result was of no statistical significance ( $p = 0.07$ ).

### Qualitative Analysis:

Four main themes emerged via thematic analysis of focus group transcripts. The students were designated a letter (A-F) when attributing quotes to evidence emerging themes. (Table 1)

<u>Themes</u>	<u>Subthemes and supporting quotes</u>
<b>Highlighting deficits in knowledge</b>	<p><u>Deficits in knowledge</u> <i>"I felt it highlighted things to me that I am glad I saw, but found hard...I felt like I've seen my problems...I think it highlights more, highlights the gaps for me"</i> (Student A)</p> <p><i>"the practice of actually putting yourself in that position to get the right words out in a pressured situation is more valuable than just being told what you should do"</i> (Student B)</p> <p><u>Lack of exposure</u> <i>"We don't often get exposure to these things"</i> (Student A)</p> <p><i>"[palliative and 'end-of-life' care is] an area that is extremely hard to get any exposure to"</i> (Student B)</p> <p><i>"having not done anything like it before"</i> <i>"never having been in that environment before"</i> <i>"I don't have much clinical experience"</i> (Students C-F)</p>
<b>Reality of simulated environment</b>	<p><u>Fostering reality</u> <i>"It felt very real to me. It did feel like it was actually happening"</i> (Student C)</p> <p><i>"My only clinical experience was with the palliative nurse, and it was in a cubicle on the ward, and it was really similar like...it seemed to coincide with that"</i>(Student D)</p> <p><u>Detracting from reality</u> <i>"I think it actually might be harder if you are like on call, and tired, and you have two other patients, and doing this to lots of different families all with different views and requiring different approaches"</i> (Student E)</p> <p><i>"I don't really feel I took anything useful in because I thought I can't take too long because there are five people watching me on the other side and we need to get on, and in real life I guess you could have more time."</i> (Student B)</p>
<b>Lack of confidence and preparedness</b>	<p><u>Confidence</u> <i>"Yea, I felt the lack of confidence to make a clinical decision. I didn't want to say the final, like, 'your mum's dying'...but you had to, it [the simulation]"</i></p>



	<p><i>forced you to do these things.” “I really valued it, I think even during exams I would come back tomorrow and do it again” (Student A)</i></p> <p><u>Preparedness</u>  Student C felt under-prepared, and went into the scenario <i>“Quite blind”</i>. They described the simulation as being <i>“really helpful, and a really good learning experience”</i></p>
<b>Learning in a safe environment</b>	<p><i>“I think it could be emotionally very difficult whereas here [sim suite] it is ok, it’s all sort of fine 10 seconds after you have ended the scenario” (Student E)</i></p> <p><i>“I feel like in real life there is more of a consequence as you say...but equally you feel there is a consequence here to being watched and analysed” (Student A)</i></p> <p><i>“It will be better doing it in this environment than for the first time doing it in real life” (Student F)</i></p>

**Table 1: Emerging themes with supporting quotations**

### **Discussion:**

This feasibility study highlights medical students’ continued lack of exposure to dying patients in the clinical environment, resulting in them experiencing challenges in relating classroom based theory to clinical practice. This echoes published reports, which demonstrate that lack of undergraduate exposure prevents students from realising personal learning needs, leaving them under-prepared for working with dying patients in the post-qualification setting.<sup>5, 11, 12</sup>

Whilst some students felt the scenarios were realistic, others felt that in reality you would likely be much busier when working in an on-call situation. This may reflect the views of those students who have experienced on-call shifts as part of their clinical attachments. This, however, is encouraging and adds strength to the positive value of ward experience at undergraduate level. It also helps demonstrate that increasing exposure to challenging patient encounters at undergraduate level will leave individuals better prepared as they enter their FY1 year.

Students found the simulations to be safe and controlled, and felt able to make mistakes without fear their actions would have any clinical consequence. Many students commented on the desire to repeat the simulation at a future date in a bid to improve confidence. Repetitive practice in medical simulations is associated with improved learner outcomes, with a 'dose-response' nature to simulation.<sup>13, 14</sup> However, repeated simulations would incur greater financial and resource commitments.

Quantitative data analysis suggests a trend towards a reduction in Thanatophobia amongst the participants as a result of the simulations, with students feeling less uncomfortable, uneasy or helpless when thinking about looking after dying patients. However, these results were not statistically significant ( $p = 0.07$ ), and given the low participant number it is likely this study was insufficiently powered to find a significant difference.

This study has three limitations. The small sample size was dictated by student, facilitator and resource availability. This reduces the chance of obtaining statistically significant and generalisable data. Secondly, a lack of validated tools makes it challenging to fully assess confidence and preparedness of students in the context of palliative and 'end-of-life' care. However, the validated tools that are available allow us to identify positive changes in attitude of students regarding care of the dying. Finally, the cost implications of running these simulations on a larger scale need to be ascertained in order to justify any potential inclusion into an undergraduate curriculum.

## Conclusion

This study adds to the lack of literature detailing the use of simulation to teach undergraduate medical students how to provide 'end-of-life' care. The results are encouraging, suggesting simulation could be a feasible and acceptable way of increasing medical student exposure to the care of a dying patient

and their family. Those responsible for developing medical undergraduate curricula may find future research findings informative when considering the use of simulation as a tool to enhance the teaching of 'end-of-life' care, placing greater emphasis on addressing the learning needs of their students as future junior doctors.

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**Contributors:** GW designed the project, recruited all participants, developed the simulation scenarios, facilitated the simulations, carried out the focus groups, undertook data analysis, and wrote the report. JM participated in qualitative analysis with expertise in thematic analysis methodology, and edited the final report. AH facilitated the simulations, undertook thematic analysis, and edited the final report.

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